Small Business Innovation Research/Small Business Tech Transfer

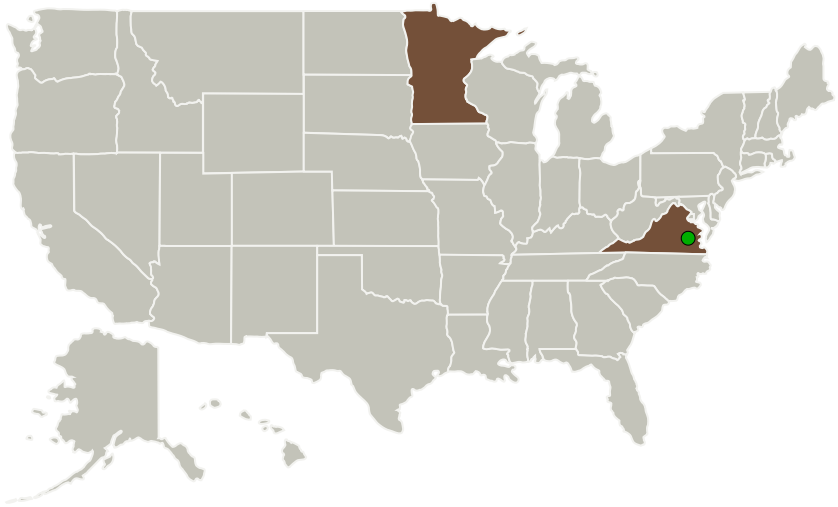
Protecting Cardiomyocytes from Mixed Fields of Radiation by BIO 300, Phase I

Completed Technology Project (2017 - 2017)

Project Introduction

The cumulative dose of radiation exposure to our astronauts remains one of the limiting roadblocks to longer duration missions in space. Humanetics Corporation (Humanetics) is developing a novel radioprotectant, BIO 300, for use in both clinical radiotherapy and as a radiation countermeasure. BIO 300 is a safe, shelf-stable pharmaceutical which has been shown to mitigate both the acute and delayed effects of radiation exposure. BIO 300 is in advanced stages of clinical development, and is currently being evaluated as a radioprotectant of healthy lung tissue during radiotherapy treatment for non-small cell lung cancer in a Phase I/II trial. One component of developing radioprotectants for space is understanding if the therapy can protect against broad-spectrums of ionizing radiation, rather than just man-made X-Rays. Thus, the objective of this proposal is to examine BIO 300's radioprotective capabilities against mission-relevant doses of neutron/gamma mixed-fields of radiation. Another component of the work proposed here, is to utilize a novel cellular platform of terminally differentiated human cardiomyocytes to investigate degenerative consequences of radiation exposure in a functional human tissue model. Together, these studies will validate the utility of BIO 300 as a countermeasure for extraterrestrial radiation exposures.

Primary U.S. Work Locations and Key Partners



Protecting cardiomyocytes from mixed fields of radiation by BIO 300, Phase I Briefing Chart Image

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Organizations Performing Work	Role	Type	Location
Humanetics Corporation	Lead Organization	Industry	
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Minnesota	Virginia

Images

Briefing Chart Image
Protecting cardiomyocytes from mixed fields of radiation by BIO 300, Phase I Briefing Chart Image *(https://techport.nasa.gov/image/133080)*

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Humanetics Corporation

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

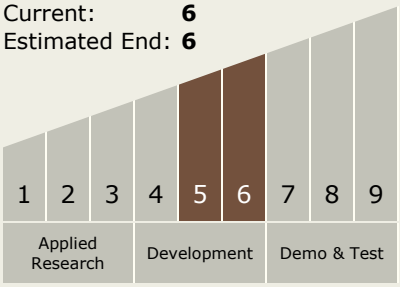
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Michael D Kaytor

Technology Maturity (TRL)

Start: **5**
Current: **6**
Estimated End: **6**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.5 Radiation
    - TX06.5.2 Radiation Mitigation and Biological Countermeasures

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System